

## REMARKS

Claims 1, 2, 4, 7-8, 11-12, 14-16, 18, 21-25, 27-52, and 54-65 remain pending in the application. Claims 1, 7, 8, 14, 15, 21, 22, and 29 are currently amended. Claims 3, 5-6, 9-10, 13, 17, 19-20, 26, and 53 are cancelled. Claims 39-48 are withdrawn from consideration. Applicants respectfully request for allowance of claims 1-2, 4, 7-8, 11-12, 14-16, 18, 21-25, 27-38, 49-52, and 54-65 based on following discussions.

### Rejections under 35 USC 102

**Claims 1, 2, 4, 9-12, 15-16, 18, 23, 27-29, 36-38, 49, 54-56, and 63-65** are rejected under 35 USC 102(e) as being anticipated by US Patent No. 6,617,538 to Mahawili (hereinafter referred to as “Mahawili”).

Independent claim 1, as amended, now includes a limitation “wherein the step of conveying to the plasma stream a source of ions occurs prior to the step of injecting the plasma stream through an aperture into the chamber.” Such limitation was recited in the previously presented claim 6, which was not rejected over Mahawili alone under 35 USC 102(e). Examiner acknowledges that Mahawili does not explicitly teach such limitation. *See, the Office Action, page 5, lines 1-5.* Thus, Applicants respectfully submit that claim 1, as amended, is not anticipated by Mahawili under 35 USC 102(e).

Independent claim 15, as amended, now includes a limitation “wherein the step of conveying to the plasma stream the source of ions occurs prior to the step of injecting the plasma stream and the fluorocompound-containing gas stream into the chamber.” Such limitation was recited in the previously presented claim 20, which was not rejected over Mahawili alone under 35 USC 102(e). Examiner acknowledges that

Mahawili does not explicitly teach such limitation. *See, the Office Action, page 5, lines*

*1-5.* Thus, Applicants respectfully submit that claim 15, as amended, is not anticipated by Mahawili under 35 USC 102(e).

Accordingly, Applicants respectfully submit that claims 2, 4, 11-12, 16, 18, 23, 27-29, 36-38, 49, 54-56, and 63-65 are not anticipated by Mahawili under 35 USC 102(e), due to their dependency from claim 1 or 15.

Claims 9-10 are cancelled.

### **Rejections under 35 USC 103**

**Claims 6-8, 13-14, 20-22, and 24** are rejected under 35 USC 103(a) as being unpatentable over Mahawili in view of US Patent No. 6,673,323 to Bhatnagar et al. (hereinafter referred to as “Bhatnagar”).

The previously presented claim 6 included a limitation “wherein the step of conveying to the plasma stream a source of ions occurs prior to the step of injecting the plasma stream through an aperture into the chamber.” Such limitation is added to claim 1 by the current amendment. Claim 6 is now cancelled.

Examiner acknowledges that Mahawili does not explicitly teach such limitation. *See, the Office Action, page 5, lines 1-5.* However, Examiner asserts that Bhatnagar teaches the step of conveying to the plasma stream a source of ions prior to injecting the plasma stream through an aperture into the chamber. *See, the Office Action, page 5, lines 6-11.* Examiner further asserts “it would have been obvious to one with ordinary skill... to modify the method of Mahawili by conveying the source of ions to the plasma stream as taught by Bhatnagar.” *See, the Office Action, page 5, lines 12-15.*

Applicants respectfully contend that Bhatnagar does not teach “conveying to the plasma stream a source of ions.” In the claimed invention, the plasma stream functions as reactants for treating the fluorocompound-containing gas stream. In Bhatnagar, additive gas is supplied from the additive gas source 230 into the effluent gas 100, which is the exhaust gas evacuated from the process chamber 25 and needs to be treated in the gas energizing reactor 210. The effluent gas 100 is comparable to the fluorocompound-containing gas stream of the claimed invention, rather than the plasma stream. Thus, Bhatnagar’s teaching of adding additive gas into the effluent gas 100 does not equate to “conveying to the plasma stream a source of ions” of the claimed invention.

Moreover, Applicants respectfully contends that despite Bhatnagar, Mahawili teaches away from “the step of conveying to the plasma stream a source of ions occurs prior to the step of injecting the plasma stream through an aperture into the chamber.” As shown in FIG. 1 of Mahawili, a quenching medium is added into the plasma jet P, after the plasma jet P has entered the chamber 42. The purpose of the quenching medium is to reduce the temperature and reactivity of the plasma jet P. *See, col. 5, lines 47-56.* As shown is FIG. 3, the quenching medium is used to stabilize the compounds produced by chemical reactions induced by the plasma. If the quenching medium were added to the plasma before it was introduced into the chamber 42 through the opening of the anode 14, it would not have been able to stabilize the plasma jet P in the chamber 42. In such hypothetical scenario, the quenching medium would have been broken down into various radicals by the plasma torch, and participated in chemical reactions. If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make

the proposed modification. *In re Gordon*, 733, F.2d 900 (Fed. Cir. 1984). Since

modifying Mahawili as suggested by Examiner would defeat the purpose of the quenching medium, i.e., reduction of temperature and reactivity, such modification is not obvious. As such, Applicants respectfully submit that independent claim 1 is patentable over Mahawili in view of Bhatnagar under 35 USC 103(a).

Independent claim 15, as amended, now includes a limitation “wherein the step of conveying to the plasma stream the source of ions occurs prior to the step of injecting the plasma stream and the fluorocompound-containing gas stream into the chamber,” which was recited in the previously presented claim 20. For the reasons discussed above, Applicants respectfully submit that claim 20 is also patentable over Mahawili in view of Bhatnagar under 35 USC 103(a).

Claims 7-8, 14, 21, 22, and 24 depend from claim 1 or 15 and include all the limitations recited therein. Thus, Applicants respectfully submit that claims 7-8, 14, 21, 22, and 24 are patentable over Mahawili in view of Bhatnagar under 35 USC 103(a), by virtue of their dependency.

Claims 6, 13, and 20 are cancelled.

**Claims 25 and 51** are rejected under 35 USC 103(a) as being unpatentable over Mahawili in view of US Patent Application Publication No. 2003/0000823 to Uhm et al. (hereinafter referred to as “Uhm”).

Claims 25 and 51 depend from claim 15 and 1, respectively. Thus, Applicants respectfully submit that claims 25 and 51 are patentable over Mahawili and Uhm under 35 USC 103(a), by virtue of their dependency.

**Claims 33, 50, 52, and 60** are rejected under 35 USC 103(a) as being unpatentable over Mahawili in view of Comparative Measurements on Thermal Plasma Jet Characteristics in Atmospheric and Low Pressure Plasma Sprayings, Kim et al., IEEE Transactions on Plasma Science, Vol. 23, No. 5, October 1995 (hereinafter referred to as “Kim”).

Claims 33, 50, 52, and 60 depend from claim 1 or 15. Thus, Applicants respectfully submit that claims 33, 50, 52, and 60 are patentable over Mahawili in view of Kim under 35 USC 103(a).

**Claims 27-32, and 54-59** are rejected under 35 USC 103(a) as being unpatentable over Mahawili in view of US Patent No. 7,220,396 to Aardahl et al. (hereinafter referred to as “Aardahl”).

Claims 27-32, and 54-59 depend from claim 1 or 15. Thus, Applicants respectfully submit that claims 27-32, and 54-59 are patentable over Mahawili in view of Aardahl under 35 USC 103(a).

**Claims 34, 35, 61, and 62** are rejected under 35 USC 103(a) as being unpatentable over Mahawili in view of US Patent No. 6,395,144 to Yi et al. (hereinafter referred to as “Yi”).

Claims 34, 35, 61, and 62 depend from claim 1 or 15. Thus, Applicants respectfully submit that claims 34, 35, 61, and 62 are patentable over Mahawili in view of Yi under 35 USC 103(a).

## CONCLUSION

Applicants have made an earnest attempt to place this application in an allowable form. In view of the foregoing remarks, it is respectfully submitted that the pending and elected claims are drawn to a novel subject matter, patentably distinguishable over the prior art of record. Examiner is therefore, respectfully requested to reconsider and withdraw the outstanding rejections.

Should Examiner deem that any further clarification is desirable, Examiner is invited to telephone the undersigned at the below listed telephone number.

It is not believed as this time that any additional fee is due. As a precaution, the Commissioner is hereby authorized to charge to Deposit Account No. 50-4244 any additional fee required by this submission.

Respectfully submitted,

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